REMARKS

This is intended as a full and complete response to the Office Action dated 7/15/2004, having a shortened statutory period for response set to expire on 10/15/2004.

Claims 1-21 are pending in the Application.

Claims 1-21 are rejected by the Office Action.

Kindly amend claim 1 and cancel claim 8.

I. Claim Rejections, 35 USC §102

Claims 1-21 stand rejected under 35 U.S.C. § 102 as being anticipated over Carrazzone US Patent Number 5,583,825.

Claim 1 is amended to include most of the limitations of claim 8. Claim 8 is now canceled. Claim 1-7 and 9-21 remain pending in the application.

The cited reference teaches using well logs from previously drilled wells to create modeled seismic responses for seismic data and then compares the modeled responses to the seismic data in order to infer lithology and fluid content.

The applicants method is designed to examine the attributes of the water leg and the attributes of the proposed hydrocarbon zone of a prospective hydrocarbon reservoir that has not been drilled. The attributes of applicant's method are without using well logs.

Applicant's method, the Padgett method, verifies that in space the transition from water to the hydrocarbon zone is geometrically flat, thereby establishing the outer limits of the hydrocarbon accumulation so that the size of the reservoir, and where to place a well can be efficiently determined, all without the need for using well logs to create the attribute file.

Claim 1 has been amended to specifically identify the attribute file sources, and none of these are well logs.

In exploration and production today, many seismic attributes are derived and these attributes give false positives. The present method imposes a geometric test on a set of seismic attributes in order to (a) rules out false positives and (b) determine the size of the reservoir.

The present invention was conceived to detect the changes in attribute response when moving from a water reservoir to a hydrocarbon reservoir to determine if exploration or production activities should continue in a given area. In addition, the method was conceived to operate in high noise, low signal to noise environments, where the data quality is poor." (Para 23 application as filed)

Applicant's method without the need for well logs to determine the size of the hydrocarbon reservoir is more environmentally friendly than other known techniques.

It is well known that after a successful exploratory well is drill, it is common to side track and down dip to determine the extent of a hydrocarbon column which determine the extent and size of the reserve. Using seismic data, methods like horizon binning and the identification of the location of the fluid contact, the size of the reservoir can be determined without the need for multiple side tracks to determine the reservoir size. This is an amazing cost savings over known techniques plus, this method causes less environmental damage than these other techniques, which require more drilling. This is a significant secondary consideration for allowability that should not be overlooked.

The Padgett method helps dramatically to avoid the mechanical hazards of side tracking which results in wells being lost, and perhaps even needing to redrill the well. This new method reduces the environmental damage hazards from side tracking. The Padgett method avoids the possibility of further damage from an exploratory well due to side tracking, which often occur causing the exploratory wells to become non-usable.

Carrozzone uses well logs as inputs, that means it can only use areas that are shallower than the deepest well drilled, and it can only be used in areas with existing area well control. Carrazzone's method requires the wellbore measurement logs, element 102, of Figure 1 and would not work without that input. See also column 8 line 26 which states "The pre-

processing phase...typically requires "two different types of input measurements: wellbore measurements and seismic reflection data."

A. Carrazzone requires well bore measurements and seismic wavelets

Carrazzone also says he needs wellbore measurements in column 9, lines 6 – 10, "these measurements must provide an adequate basis of analysis of the seismic reflection data at the calibration location and must provide a basis for understanding the expected hydrocarbon signature."

Carrazone, plainly requires well bore data, and Applicant does not require well bore data as the attribute file for the first step of the method.

Claim 1 has been modified to be clear on this point.

Horizoning binning, the present method, does not have the constraints of Carrazzone, the present method can be used in areas without any well nearby and without an adjacent well area.

Horizon binning does not require the use of well logs to determine a prospective hydrocarbon reservoir size or the location of the water contact.

The elastic parameters taught by Carrazzone are the attributes that the horizon binning of the present method is designed to test.

The Carrazzone method uses wellbore data to generate a wavelet. The wavelet is then used to test the Carrazone method using wellbore date to obtain the proposed size of the reservoir. See Figure 4, element 206, and element 210 .

No wavelet is used in Applicants method to determine reservoir size.

The input of the applicants method uses "an attribute file with attribute values with a second horizon file" (Page 18, Line 4-5) The applicants method also uses a time file with time values or a depth file with depth values to be merged with the attribute file. (Page 18, Line 5-6) The results are obtained by merging the data with a discontinuity with a water reservoir

model and at least one hydrocarbon reservoir model to confirm the theory and finally using the discontinuity to determine a boundary between the water reservoir model and the hydrocarbon reservoir model and the corresponding water reservoir and the corresponding hydrocarbon reservoir for an identified area.

Historically, geologists have not performed this kind of attribute analysis for fluid contacts. This horizon binning prevents drilling dry wells which is a significant benefit over other commercial techniques.

Applicant's method, the Padgett method, is designed, in one embodiment, to use the results suggested by the Carrazzone reference, that is, the predictions of the lithology, the fluid content at the target location, as well as the lithology and fluid content at all locations within the geological structure. This combination of information can then be used as the input attribute file in the Padgett invention.

B. Carrazzone uses prestack seismic data

Additionally, Carrazzone uses prestack seismic data, and does not use attributes derived from seismic data. With this prestack seismic data Carrazzone performs an inversion process, See column 19 lines 58 to 65.

Carrazzone teaches in column 19, line 58... "Before proceeding with the description of the pre-stack inversion phase of the invention (reference numeral 200 in Fig 1) certain background information regarding the physical and mathematical details of the wave propogation model and the mathematical methods used in the least square inversion will be described...".

Applicant does not perform this calculation.

C. Carrazone performs calculations at calibration and target locations

Carrazone teaches that "elastic inversions at fixed wavelet are carried out at all midpoint locations of interest over both the calibration and target location." See column 36 lines 26 et. seq.

In contrast, horizoning binning as defined in the claims, does not require a specific calibration location or a predefined target location. Dramatically different from Carrazzone, the Padget method requires the attributes and structure to be defined across the entire geological feature which includes both the proposed hydrocarbon leg and the down dip water legs, not just a target location. This more broader requirement insures higher accuracy in the model.

See Carrazzone column 36 line 53, that the reflection inversions are applied to the pre-stack seismic data which has been rescaled by the weight function described earlier. The pre-stack seismic data is simply not used in the present method and could not be used. Attributes derived from prestack data can be used, but in Applicant's method the prestack data cannot used directly.

In this use the applicants method would be an extension of the method of Carrazzone and not anticipated as suggested by the office action. The applicant's method is not limited to an attribute file created by using the Carrazzone method and can use other methods and data to create the input attribute file for use in the applicant's method.

The benefit of the Padgett method over Carrazzone is the enhanced ability, that is, the improved reliability and consistant lithology and fluid content predictions to ascertain the size of a hydrocarbon reservoir, and additionally to determine the boundary or discontinuity between the water leg and the corresponding hydrocarbon reservoir for an identified area, all without the need to use well log data.

The Padget model recognizes that the fluid contact is flat, and it is the geometric recognition of the flat fluid content that enables these determinations to be made without well log data. This is a surprising and unexpected results that is not taught or suggested in Carrazzone.

By using the applicant's method to determine the discontinuity between the corresponding water reservoir and the corresponding hydrocarbon reservoir for an identified area a company can save time and money by choosing not to drill in a place where there may be a large fluid content but that fluid content may be extensively water and of no value.

The result of an exploration and production company using the Padgett method could be in locating a profitable areas, even though the size of the reservoir may not be the most appealing to drill.

The detail on the fluid contact is important in the completion of wells, prior to going on production, it is important not to complete too close to the water interface, because if the completions are too close the well interface, the well will "cone up" water, producing more water than hydrocarbons and be a lost well, and without profit.

Reconsideration of this Application with the amended claims in view of the remarks expressed throughout this Response is respectfully requested.

Respectfully submitted,

Date: 9-27-04

Wendy K. Buskop
Patent Attorney
Reg. No. 32,202

Please mail correspondence to:
Wendy K. Buskop
Buskop Law Group, P.C.
1717 St. James Place, Suite 500
Houston, Texas 77056
713.403.7411